Lab Agenda

Advancing Deterrence

Fiscal Year 2027



Los Alamos
NATIONAL LABORATORY

Commitment Statement

The Leadership Team will advance the Laboratory's national security mission, support its people, strengthen its culture, and drive progress on the strategic imperatives and institutional goals outlined in the Lab Agenda.



The Los Alamos National Laboratory Leadership Team at their summer leadership retreat.

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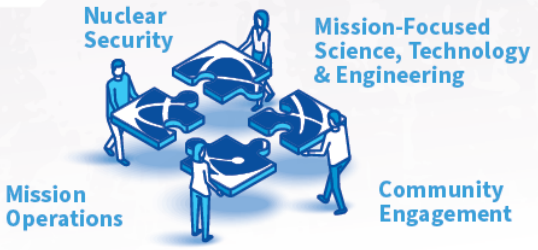
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Executive Summary

Mission Solve national security challenges through simultaneous excellence.



Strategic Imperatives

Nuclear Deterrence
Ensure the effectiveness of our nuclear deterrent and certify current and future weapons.

Technical Leadership
Advance relevant research through scientific and technical breakthroughs.

Threat Reduction
Anticipate and proactively respond to emerging global security threats.

Trustworthy Operations
Demonstrate and be acclaimed for trustworthy operations.

FY27 Institutional Goals



Agile Manufacturing
Accelerate technology maturation to enable rapid prototyping on compressed, threat-relevant timelines.



AI Reasoning
Harness AI reasoning and computation to enable mission impact through breakthroughs in security and science.



Experimental Capabilities
Modernize key experimental capabilities for weapons performance to meet Nuclear Security Enterprise needs.

Production Systems
Mature and integrate business systems to enable efficient production.





Strategic Deterrence
Develop, assess, and prototype tools and concepts to address strategic needs.

Values and Behaviors

Sustain a culture that values service, integrity, teamwork, and excellence.

How we do our work is as important as what we do.

Service	Serve our nation, partners, and each other.
Integrity	Demonstrate honesty, ethical conduct, accountable stewardship, and individual responsibility.
Teamwork	Respect and collaborate with our colleagues and partners.
Excellence	Ensuring safe and secure mission delivery.

Collaborative problem solving
Continuous learning
Shared outcome
Trustworthy
Commitment

Introduction

Los Alamos National Laboratory plays a vital role in safeguarding the United States and its allies against the world's most serious threats. In a time of renewed urgency for the Nuclear Security Enterprise, the Laboratory is committed to advancing deterrence across all missions. The coming decades are a critical time for the nation and our allies. The US is modernizing its strategic forces as it confronts two nuclear-near-peers for the first time. Artificial intelligence (AI) is transforming science, security, and technology at every level. In this environment, deterrence depends on the scientific excellence to design, produce, certify, and field capabilities on threat-relevant timelines. To meet these global challenges, the Laboratory draws on its multidisciplinary expertise—spanning signature science, supercomputing and AI, nuclear and particle physics, weapons design and engineering, and more—to develop innovative solutions that advance agile, effective deterrence against nuclear warfare and other emerging dangers. Through meeting these objectives, the Laboratory not only strengthens national security but also drives world-changing discoveries.

Meeting the Needs of the Nation

As a federally funded research and development center, the Laboratory's comprehensive deterrence framework reflects key US priorities across nuclear security, intelligence, defense, nonproliferation, counterterrorism, emergency response, science leadership, energy security, environmental management, and beyond. This strategy is closely aligned with guidance from the Department of Energy (DOE), the National Nuclear Security Administration (NNSA), and national policy documents.

Lab Agenda

The Lab Agenda helps align the Laboratory's work with national needs, foster collaborative implementation across organizations, and inform decisions—from institutional investments to individual goals. This year's agenda includes the Laboratory's strategic imperatives, institutional goals for fiscal year 2027 (FY27), and the values and behaviors that shape our culture. Everyone at the Laboratory has a role in helping achieve strategic imperatives. Institutional goals are purposefully focused on key challenges and opportunities where near-term, cross-cutting discretionary investments will help ensure the Laboratory's national-scale impact. Necessarily, then, the institutional goals do not capture all the Laboratory's priorities or encompass all areas of the Laboratory's work. However, regardless of whether our individual efforts align directly with these select goals, we are united in achieving the Laboratory's mission of advancing deterrence, progressing our strategic imperatives, upholding our values, and securing the future together.

Laboratory Mission

To solve national security challenges through simultaneous excellence in nuclear security; mission-focused science, technology, and engineering; and community engagement.

Vision

To be trusted by our nation, emulated by our peers, and respected by the world.

Culture

How we do our work is as important as what we do.

Strategic Imperatives

Los Alamos National Laboratory has four strategic imperatives that guide mission delivery: nuclear deterrence, threat reduction, technical leadership, and trustworthy operations.

Nuclear Deterrence

Lead the nation in evaluating, developing, and ensuring the effectiveness of our nuclear deterrent, including the design, production, and certification of current and future nuclear weapons.

As 21st century geopolitical realities reshape our national security policy, deterring nuclear attacks and preventing large-scale conventional warfare remains one of our nation's priorities. Los Alamos is the design agency for four of the six weapons systems in the United States' on-alert deterrent—the B61 (Air Force), the W78 (Air Force), the W76 (Navy), and the W88 (Navy). Through accelerated production and world-class science and engineering facilities, the Laboratory supports a safe, secure, and effective nuclear deterrent. Through its catalog of deterrence programs, the Laboratory delivers capabilities that assure its allies, deter its adversaries, and support flexible, tailored, and extended deterrence.

Technical Leadership

Deliver scientific discoveries and technical breakthroughs to advance relevant research frontiers and anticipate emerging national security risks.

Since its inception as the Manhattan Project, the Laboratory has led the nation and the world in breakthrough scientific discoveries backed by the technical expertise to translate those discoveries into action. The Laboratory's five Transformational Capabilities—Cross-Domain Threat Deterrence, Dynamic Extreme Physics, Nuclear Explosive Package Prototyping, Plutonium and Actinide Science, and Scientific Computing—advance cutting-edge research and development and maintain competitive advantage in the scientific capabilities underlying the Laboratory's mission.

Threat Reduction

Anticipate persistent and emerging threats to global security in all domains; develop and deploy revolutionary tools to detect, deter, and respond proactively.

The Laboratory develops innovative solutions to identify and rapidly respond to emerging threats worldwide, including cyber-physical vulnerabilities, threats in space, risks with new technologies, and more. The Laboratory also collaborates with the Intelligence Community and the US military to identify state-of-the-art technologies such as AI innovations to maintain our nation's advantage over its adversaries and to provide cutting-edge technologies that combat small-scale, intense conflict.

Trustworthy Operations

Consistently demonstrate and be recognized by stakeholders for trusted and trustworthy operations.

To maintain the trust of our national, scientific, and neighboring communities and continue to be a force for good, the Laboratory has tailored operational processes and systems to effectively and safely carry out our mission. These functions underpin our success in the other three imperatives by ensuring facilities are safe, secure, and available, business and computer systems function, and employees are supported. Managing risk with discipline, the Laboratory takes on appropriate programmatic risk to advance mission success and reduce cost, schedule, and execution barriers that do not improve safety, security, or quality.

Institutional Goals

The Laboratory's institutional goals focus on key challenges and opportunities that require urgent, cross-organizational collaboration to align scientific and technical opportunities with national security needs. Each goal supports two or more strategic imperatives and is designed to drive significant progress through focused investments and actions.

For FY27, the Laboratory will prioritize five institutional goals: Agile Manufacturing; AI Reasoning; Experimental Capabilities; Production Systems; and Strategic Deterrence.

Excellence and continuous improvement in foundational and enduring functions—from safety and security to facilities management, business systems, human resources, and community partnerships—are essential for the success of each goal.

Agile Manufacturing

Accelerate and mature capabilities for rapid manufacturing that enable nuclear concepts to move from design to prototype to deployable production pathways on compressed, threat-relevant timelines.

AI Reasoning

Harness AI reasoning and computation in line with the Genesis Mission to accelerate the pace of scientific discovery, develop new technologies, and transform the way the Laboratory solves national security challenges.

Experimental Capabilities

Modernize key capabilities to advance accelerator science, explosives formulations, and materials manufacturing to support weapons performance and Nuclear Security Enterprise needs.

Production Systems

Mature the Laboratory's production and business systems to achieve and sustain a high level of operational performance, control, and quality performance across all of the Laboratory's production missions.

Strategic Deterrence

Develop the evidence-based analytic capability needed to inform the emerging national debate on how to structure a modern, dynamic, flexible, and comprehensive deterrent.

Agile Manufacturing

Goal

Accelerate and mature capabilities for rapid manufacturing that enable nuclear concepts to move from design to prototype to deployable production pathways on compressed, threat-relevant timelines.

Context

The Laboratory's deterrence and threat-reduction missions rely on using advanced manufacturing to support tooling development, design analysis and testing, advanced materials science for new weapon component materials, and improved manufacturing processes that streamline the production of qualified parts. A focused agile manufacturing effort helps determine what future capabilities and funding are necessary to maintain and improve over the long-term. This work will enable the Laboratory to create full-sized prototypes and processes that are relevant for production and adaptable to future technology needs. By investing in agile manufacturing, the Laboratory will build a new capability that allows engineering and physics design principles to be examined while new materials and processes are in development. The combination of design and manufacturing science in a prototyping capability enables the acceleration of technology-readiness-level and manufacturing-readiness-level schedules, underpinning an ability to build, qualify, and certify new components with new manufacturing technologies. This framework will drive rapid maturation of conceptual designs from prototypes to small-lot production, with the goal of inserting new technology into programs across the US nuclear enterprise.

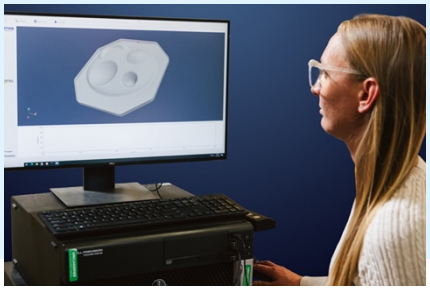
Recent Accomplishments

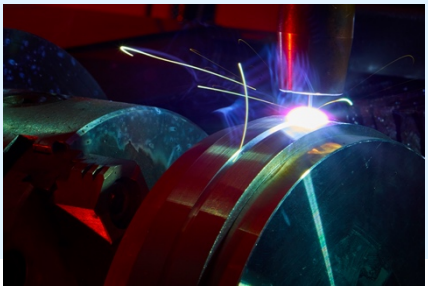
- Reduced timeline to produce classified metal components from up to 18 months to 1–2 months through optimized tooling and forming workflow.
- Demonstrated end-to-end process for unclassified, specialized tooling from digital design through metal additive manufacturing (AM), machining, and heat treatment to produce prototype components.
- Designed tooling and fixturing for robotics installation to support future autonomous manufacturing and inspection. Metal AM and machining are also underway.

Desired Outcomes

- By 2027, demonstrate a new, faster way of designing and producing weapons technology at scale that accelerates the timeframe from initial design to production and reduces the required amount of qualification.
- By 2028, demonstrate the use of advanced manufacturing to produce prototype parts using exotic and hazardous materials and validate the ability of advanced manufacturing techniques to unlock unique material properties and rapidly produce highly specialized parts from those materials, if desired.







AI Reasoning

Goal

Harness AI reasoning and computation in line with the Genesis Mission to accelerate the pace of scientific discovery, develop new technologies, and transform the way the Laboratory solves national security challenges.

Context

With Laboratory Institutional investments and Genesis DOE/NNSA funding, the Laboratory is creating a transformative, AI-driven ecosystem that enables accelerated scientific discovery and technology development for our national security missions. This effort combines industry's frontier reasoning models with the Laboratory's bespoke AI models, high-performance computing capabilities, secure data infrastructure, and expertise to transform the way the Laboratory addresses design for agile deterrence, materials discovery and manufacturing, and national security decision-making. The new AI ecosystem will build on the Lab's successes with the Venado supercomputer, NVIDIA and OpenAI partnerships, and the ArtIMis project, incorporating "thinking" and "action" agents. The former will analyze information to solve problems, while the latter will handle tasks like coding, simulation campaigns, experimental design, mathematical reasoning and optimization, and manufacturing and testing. This initiative will also develop a small set of AI foundation models focused on critical needs, such as understanding complex physical systems and predicting how different materials will behave, which can be called on by the overall AI ecosystem.

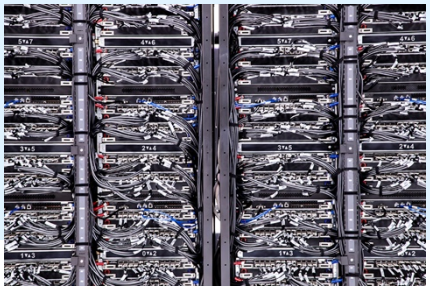
Recent Accomplishments

- Advanced ArtIMis, which continues to build a strong, unique AI ecosystem, including agentic systems (URSA) and fast emulators built on scientific foundation models.
- Established a FAIR-principled software standard for data through DIANA, with pilot projects now underway across the Laboratory. AI-assisted curation tools are maturing and will accelerate collection of AI-ready data.
- Expanded high-performance computing AI capacity significantly, with six new Selene racks, bringing the total capacity to 19 nodes (152 H100 GPUs). Ten GB300 servers (80 GPUs) arrived in August to enhance on-premises LLM inference through the AI Portal. Substantial Vision hardware NVIDIA/HPE procurements will arrive in FY27.

Desired Outcomes

- Develop a prototype defense science AI ecosystem that includes (1) a system of agents for hypothesis generation, evidence evaluation, and cost-benefit decision-making; (2) a framework for task-specific agents and a library of such agents developed while solving example problems; and (3) fine-tuned versions of the Laboratory's foundation models, which will help simulate complex physical systems and predict material performance.
- Execute the Laboratory-led and -supported Genesis Mission projects.







Experimental Capabilities

Goal

Modernize key capabilities to advance accelerator science, explosives formulations, and materials manufacturing to support weapons performance and Nuclear Security Enterprise needs.

Context

The Nuclear Security Enterprise (NSE) relies on the Laboratory's experimental capabilities—from focused experiments on materials and components to integrated systems experiments—to underwrite the nuclear deterrent. This effort focuses on establishing a lasting mechanism to modernize the Laboratory's experimental capabilities and position it to provide next-generation radiography capabilities. The Laboratory will coordinate modernization investments in its flagship facilities, starting with the Los Alamos Neutron Science Center (LANSCE) and the Dual-Axis Radiographic Hydrodynamic Test (DARHT) facility and expanding to the Contained Firing Facility and firing sites. First, the Laboratory will target resources to complete the LANSCE Solid-State High-Power Radio Frequency (RF) and DARHT Multi-Pulse Target Line projects. In the intermediate term, the initiative will execute the LANSCE Accelerator Modernization Project (LAMP) and advance major projects at LANSCE, DARHT, the Energetic Material Characterization (EMC) R&D Campus, and the Integrated Testbed for Agile Manufacturing (ITAM). By investing in these mission-essential capabilities and strategically integrating across projects, the Laboratory will ensure access to the experimental capabilities needed by the NSE into the future.

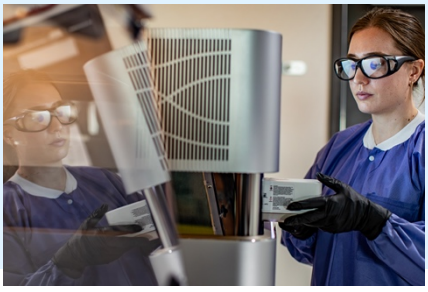
Recent Accomplishments

- Awarded LAMP CD-1 approval in June 2026, initiating the formal design phase of a billion-dollar-class investment and positioning the Laboratory as the pinnacle of national accelerator science.
- Received the first 5-kW pre-production solid-state power amplifier from Integra Technologies.
- Submitted accelerator safety envelope and safety assessment documents for K-15 and the Microtron to the NNSA, demonstrating leadership in accelerator safety and readiness.

Desired Outcomes

- Define pathways to transform accelerator and experimental infrastructure after key early successes, including (1) completion of the LANSCE Solid-State High-Power RF and DARHT Multi-Pulse Target Line projects and (2) full compliance with DOE Order 420.2D for K-15 and Microtron.
- Achieve strong sponsorship for a coordinated portfolio of experimental capability modernization projects, including LANSCE Enhancements (LANE), the DARHT Capability Expansion (DCX), the Sigma Complex Investment Plan, and the TA-9 Campus plan, encompassing EMC.
- Advance the future dynamic radiography capability necessary for stockpile modernization challenges.





Production Systems

Goal

Mature the Laboratory's production and business systems to achieve and sustain a high level of operational performance, control, and quality performance across all of the Laboratory's production missions.

Context

The Laboratory's production mission is central to US national security. This effort will mature and integrate the Laboratory's production processes and critical business support systems to deliver reliable, scalable, and resilient production capacity and operational performance across all production missions, including the Laboratory's goal to produce at least 100 War Reserve pits by the end of 2028. The Laboratory will improve production through six strategies: (1) strategically address gaps or weaknesses in the maturity of institutional production mission processes, systems, supporting business services, and tools; (2) continuously improve the technical production processes mission to enable success; (3) continuously improve and optimize all processes by identifying additional projects or initiatives; (4) apply scalable and tailorable solutions to meet crosscutting institutional needs; (5) work collaboratively with NNSA headquarters and programs, with regulators, and across the NSE to broaden the policy-based aperture for work performed in high-hazard nuclear and high-explosive facilities; and (6) partner with NNSA NSE sites and DOE sites across the complex, leveraging strengths and lessons learned.

Recent Accomplishments

- Organized integrated portfolio for production modernization, spanning six strategic areas and more than twenty coordinated initiatives.
- Established a common approach for planning, prioritizing, and reviewing production modernization investments across participating organizations.
- Delivered digital production capabilities by implementing production architecture, FORGE, production data, and representative product lifecycle management capabilities.
- Expanded production modernization partnerships across the Laboratory, integrating workforce, digital, operational, and support organizations around common production objectives.

Desired Outcomes

- Institutional business and operating systems that simultaneously support R&D, production, and operations, including a fully digital production environment process and a pilot of that process.
- A Lean Six Sigma program tailored to the Laboratory production environment, providing tools and problem-solving methods to address inefficient processes and offering mentorship in continuous improvement strategies.
- An asset management system that tracks equipment and other assets and allows for proactive maintenance. The system is focused on plutonium production facilities but could be adapted by other institutional facilities.
- Enabling technologies like ML, RFID, and mechatronics applied in secure, high-hazard production environments.





Strategic Deterrence

Goal

Develop the evidence-based analytic capability needed to inform the emerging national debate on how to structure a modern, dynamic, flexible, and comprehensive deterrent.

Context

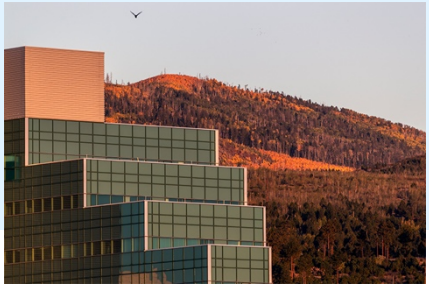
The US is at an inflection point as it undertakes the modernization of its strategic and conventional forces to accomplish new missions in an evolving global landscape. Given its role as both a design agency and a production agency, the Laboratory bears a special responsibility within the NSE to address the principal concerns of the US government. This effort will integrate resources across the Laboratory's directorates to provide decision-makers within and beyond the Laboratory with feasible options for a modern, flexible, and comprehensive deterrent, including prompt, precise, proportional, and producible capabilities for emerging requirements. By investing in this integrated effort, the Laboratory will build and apply new, important capabilities to support strategic deterrence and position itself to remain the nation's central technical resource for anticipating and addressing strategic competition in a complex global landscape.

Recent Accomplishments

- Established the Theater Development Office within the Strategic Assessment System Analysis (SASA) division to ensure oversight of DDW-theater system engagement.
- Deployed a SASA representative to STRATCOM, pending position for PACOM.
- Launched the Cross-Domain Threat Deterrence Transformational Capability (TRAC) to detect and counter evolving threats across multiple domains.
- Maturing a suite of modeling and simulation tools to support a systems campaign approach, creating an integrated overview for leadership.

Desired Outcomes

- Strong working relationships with key stakeholders, including STRATCOM, INDO-PACOM, EUCOM, SPACECOM, military service branches, and the NSE labs, plants, and sites.
- Laboratory-developed methodologies and products are integrated into Laboratory plans and planning.
- Recognition from NNSA of Laboratory-developed A-to-Z methodology and incorporation of the methodology and its products into headquarters planning and plans.
- Combatant commands and service branches endorse Laboratory-developed software to inform plans and requirements.


Values and Behaviors

The Laboratory achieves its national security mission through a culture in which how we do our work is as important as what we do. This culture is embodied in our institutional values of service, integrity, teamwork, and excellence. The Laboratory focuses on nurturing these values through continuous learning to strengthen our cultural foundation at the individual, leadership, and institutional levels.

Values

Service:	Serving our nation, our partners, our community, and each other.
Integrity:	Demonstrating honesty, ethical conduct, accountable stewardship, and individual responsibility.
Teamwork:	Achieving our best by respecting different opinions and backgrounds, exploring alternatives, and collaborating with colleagues and partners.
Excellence:	Ensuring safe and secure mission delivery in nuclear security; science, technology, and engineering; operations; and community relations.

Behaviors

Collaborative Problem Solving:	Exhibits initiative and willingness to work with others and be inclusive with people inside and outside their organization; is open-minded to find appropriate solutions to facilitate the accomplishment of Laboratory work goals.
Continuous Learning:	Proactively develops, adapts, and transforms oneself and shares lessons with others. Applies feedback and lessons learned in response to changing mission, business needs, processes and work responsibilities. Assesses risk to ensure it is addressed appropriately.
Shared Outcome:	Demonstrates a shared purpose within the Laboratory. Respects others and maintains a positive/responsive attitude to accomplish work in an ethical, efficient, and cost-effective manner. Encourages and supports security and safety for ourselves and each other.
Trustworthy:	Interacts with others in a way that gives them confidence in one's intentions and those of the organization; communicates openly, honestly, and with integrity with colleagues and customers; follows through on initiatives.
Commitment:	Stays motivated, focused, and dedicated to a position or plan of action.

Acronyms and Abbreviations

AI	artificial intelligence
AM	additive manufacturing
ArtIMis	Artificial Intelligence for Mission
CD-1	Critical Decision 1 (Marks the completion of the project definition phase and the conceptual design. Provides authorization to begin project execution.)
DARHT	Dual-Axis Radiographic Hydrodynamic Test (facility)
DCX	DARHT Capability Expansion
DDOPS	Deputy Director of Operations
DDSTE	Deputy Director of Science, Technology, & Engineering
DDW	Deputy Director of Weapons
DIANA	Data Infrastructure for Artificial intelligence and Nextgen Analytics
DOD	Department of Defense
DOE	Department of Energy
EMC	Energetic Material Characterization
EUCOM	European Command
FAIR	findable, accessible, interoperable, and reusable
FORGE	Factory Organization and Resource Gathering Environment
FY	fiscal year
HR	Human Resources
INDO-PACOM	Indo-Pacific Command
ITAM	Integrated Testbed for Agile Manufacturing
LAMP	LANSCE Accelerator Modernization Project
LANSCE	Los Alamos Neutron Science Center (facility)
LANL	Los Alamos National Laboratory
LLM	large language model
ML	machine learning
NASA	National Aeronautics and Space Administration

NNSA	National Nuclear Security Administration
NSE	Nuclear Security Enterprise
R&D	research and development
RF	radio frequency
RFID	radio-frequency identification
SASA	Strategic Assessment and System Analysis
SPACECOM	Space Command
STRATCOM	Strategic Command
TA	Technical Area
TRACs	Transformational Capabilities
URSA	Universal Research and Scientific Agent
US	United States

Advancing
Deterrence

Los Alamos
NATIONAL LABORATORY

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